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July 19, 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Farooq AHMED et al
For:	SOLVENT FREE SILICON COATING COMPOSITION
Serial No.:	10/685,469
Filed:	October 16, 2003
Art Unit:	1712
Our Reference:	JJ-12 005US

133 Richmond Street West
Toronto, Ontario M5H 2L7
July 19, 2004

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Attention: Examiner Kuo-Liang Peng

Dear Sir:

This is in response to the Office Action dated April 19, 2004 in the above-identified patent application. Kindly amend the application as follows:

Amendments to the Abstract begin on page 2 of this paper.

Amendments to the Disclosure begin on page 4 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 9 of this paper.

Remarks/Arguments begin on page 17 of this paper.

Kindly amend the abstract as follows:

The present invention relates to a solvent free one-part room temperature vulcanizable organopolysiloxane rubber composition which crosslinks in the presence of moisture to form a high gloss coating with minimal shrinkage for surfaces. ~~The one-part organopolysiloxane rubber composition consists essentially of the product which is obtained by mixing the following:~~

~~a) from about 20 to about 60 weight percent of one or more polydiorganosiloxane fluids of the formula~~

~~$HO[(R)_2SiO]_n(R)_2SiOH$~~

~~in which R is a monovalent alkyl or alkylene radical having 1 to 8 carbon atoms or a phenyl radical, and n has an average value such that the viscosity is from about 10 to about 20,000 centipoise at 25°C;~~

~~b) from 0 to about 8 weight percent of a bifunctional chain extender of the general formula~~

~~$R^4_2\text{-}Si\text{-}X_2$~~

~~where X is alkoxy or ketoximino and R4 is a monovalent alkyl or alkylene radical having 1 to 8 carbon atoms or a phenyl radical;~~

~~c) from 0 to about 50 weight percent of an inorganic extending or non-reinforcing filler;~~

~~d) from about 0.5 to about 20 weight percent of an amorphous SiO_2 reinforcing filler having a surface area of between about 50 to 250 m^2/g and a particle size range between about 0.01 and 0.03 microns;~~

~~e) from about 3 to about 15 weight percent of one or more crosslinking agents of general formula~~

$$\cancel{(X)_{4-m}\text{-Si-}R'_m}$$

~~where R' is an alkyl, alkylene or phenyl radical (preferably methyl or ethyl), X is an alkyl radical with a functional group selected from carboxyl, ketoximino, alkoxy, carbonyl or amine linked directly to the silicone atom, and m is an integer of from 0 to 2;~~

~~f) from about 0.2 to about 3 weight percent of an adhesion promoter of the formula~~

$$\cancel{R^3_b}$$

$$\cancel{(R^2O)_{3-b}SiR^1}$$

~~in which R^2 and R^3 are independently selected from monovalent alkyl or alkylene radicals having 1 to 8 carbon atoms or a phenyl radical which may optionally be substituted with an alkyl radical having 1 to 8 carbon atoms, b is an integer between 0 and 3, and R^1 is a saturated, unsaturated or aromatic hydrocarbon radical having 1 to 10 carbon atoms which may optionally contain a functional group; and~~

~~g) from about 0.02 to about 3 weight percent of an organotin salt as a condensation catalyst.~~

Kindly amend the disclosure as follows:

On page 2, paragraph beginning on line 19:

a) from about 20 to about 60 weight percent of one or more polydiorganosiloxane fluids of the formula

$$HO[(R)_2SiO]_n(R)_2SiOH$$

in which R is a monovalent alkyl or ~~alkylene~~ alkenyl radical having 1 to 8 carbon atoms or a phenyl radical, and n has an average value such that the viscosity is from about 10 to about 10,000 centipoise at 25°C,

b) from 0 to about 8 weight percent of a bifunctional chain extender of the general formula

$$R^4{}_2\text{-Si-}X_2$$

where X is alkoxy or ketoximino and R4 is a monovalent alkyl or alkenyl radical having 1 to 8 carbon atoms or a phenyl radical;

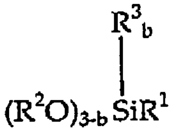
On page 3, paragraph beginning on line 13:

e) from about 3 to about 15 weight percent of one or more crosslinking agents of general formula

$$(X)_{4-m}\text{-Si-}R'_m$$

where R′ is an alkyl, alkenyl or phenyl radical (preferably methyl or ethyl), X is an alkyl radical with a functional group selected from carboxyl, ketoximino, alkoxy, carbonyl or amine linked directly to the silicone atom, and m is an integer of from 0 to 2;

f) from about 0.2 to about 3 weight percent of an adhesion promoter of the formula



$$(R^2O)_{3-b}\overset{\overset{\displaystyle R^3_b}{|}}{Si}R^1$$

in which R^2 and R^3 are independently selected from monovalent alkyl or alkenyl radicals having 1 to 8 carbon atoms or a phenyl radical which may optionally be substituted with an alkyl radical having 1 to 8 carbon atoms, b is an integer between 0 and 3, and R^1 is a saturated, unsaturated or aromatic hydrocarbon radical having 1 to 10 carbon atoms which may optionally contain a functional group; and

On page 5, paragraph beginning on line 27:

The one-part organopolysiloxane rubber compositions of the present invention for use as a protective coating contain about 20 to about 60 weight percent of one or more polydiorganosiloxane fluids of the formula:

$$HO[(R)_2SiO]_n(R)_2SiOH$$

in which R is a monovalent alkyl or ~~alkylene~~ alkenyl radical having 1 to 8 carbon atoms or a phenyl radical, and n has an average value such that the viscosity is from about 100 to about 20,000 centipoise at 25°C. Preferably n has an average value such that the viscosity is between about 500 and about 10,000 centipoise at 25°C, more preferably between about 1,000 and about 5,000 centipoise at 25°C. Polydimethylsiloxane is the most preferable silicone polymer fluid. The polydimethylsiloxanes may contain small amounts of monomethylsiloxane units and methyl radical replaced with other radicals in small amounts as impurities such as is found in commercial products, but the preferred fluid contains only polydimethylsiloxane. When using low viscosity fluids, generally 1000 centipoise or less, it may be advantageous to add bifunctional chain extenders of the general formula

$$R^4{}_2\text{-Si-}X_2$$

where X is alkoxy or ketoximino and R4 is a monovalent alkyl or ~~alkylene~~ alkenyl radical having 1 to 8 carbon atoms or a phenyl radical. If chain extenders are utilized they are generally present in an amount of between about 2 weight percent and about 8 weight percent.

On page 8, paragraphs beginning on line 3:

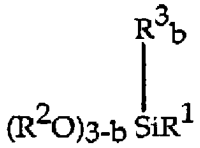
The composition also contains about 3 to about 15 weight percent, preferably about 3 to about 10 weight percent of an organofunctional cross-linking agent of general formula

$$(X)_{4-m}\text{-Si-}R'_m$$

where R′ is an alkyl, ~~alkylene~~ alkenyl or phenyl radical (preferably methyl or ethyl), X is an alkyl radical with a functional group selected from carboxyl, ketoximino, alkoxy, carbonyl or amine linked directly to the silicone atom, and m is an integer of from 0 to 2. Preferably the cross linking agent is an oximinosilane cross linking agent of the formula $RSi(ON{=}CR'_2)_3$ in which R and R′ each represent a monovalent alkyl or ~~alkylene~~ alkenyl radical having 1 to 8 carbon atoms or a phenyl radical, preferably an alkyl radical such as methyl, ethyl, propyl, butyl, or an ~~alkylene~~

alkenyl radical such as vinyl, allyl, or a phenyl radical. The preferred R and R′ are alkyl or vinyl radicals, most preferably methyl and ethyl radicals.

The composition also contains about 0.2 to about 3 weight percent of an organo functional silane as an adhesion promoter. Preferably the organo functional silane has the formula



$$(R^2O)_{3-b}\,\overset{\overset{R^3_b}{|}}{\mathrm{Si}}R^1$$

wherein R^2 and R^3 are independently selected from monovalent alkyl or ~~alkylene~~ alkenyl radicals having 1 to 8 carbon atoms or a phenyl radical, b is an integer from 0 to 3, preferably 0, and R^1 is a saturated, unsaturated or aromatic hydrocarbon radical being 1 to 10 carbon atoms, which may be further functionalized by a member selected from the group consisting of amino, ether, epoxy, isocyanate, cyano, acryloxy and acyloxy and combinations thereof. R^2 and R^3 are preferably an alkyl radical such as, for example, methyl, ethyl, propyl, butyl, or an ~~alkylene~~ alkenyl radical such as vinyl and allyl. More preferably R^2 and R^3 are alkyl radicals, most preferably methyl, ethyl or propyl radicals. Preferably R^1 is an alkyl group, more preferably further functionalized by one or more amino group. The most preferred organo-functional silane is N-(2-aminoethyl-3-aminopropyl)trimethoxysilane.

In all of the above compounds, the alkyl includes straight, branched or cyclic radicals. Among the alkyl groups are C_{1-8} straight or branched-chain alkyl such as, for example, methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, tert-butyl, pentyl, isopentyl, hexyl, etc., the cycloalkyl are C_{3-8} cycloalkyl such as, for example, cyclopropyl, cyclobutyl, cyclohexyl, etc., the ~~alkylene~~ alkenyl groups are C_{1-8} alkylene such as, for example, vinyl and allyl. The above groups as well as the phenyl radicals may be further functionalized by including in the chain or ring structure, as the case may be, a group selected from the class consisting of amino, ether, epoxy, isocyanate, cyano, acryloxy, acyloxy and combinations, so long as the functionalization does not adversely affect the desired properties of the compound.